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1 GPS-based geographic addressing, routing, and resource discovery

Tomasz Imieliński, Julio C. Navas

 April 1999 **Communications of the ACM**, Volume 42 Issue 4

Full text available: pdf(329.24 KB)

html(32.72 KB)

 Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#), [review](#)

2 Special issue on wireless pan & sensor networks: Modeling and analyzing the impact of location inconsistencies on geographic routing in wireless networks

Yongjin Kim, Jae-Joon Lee, Ahmed Helmy

 January 2004 **ACM SIGMOBILE Mobile Computing and Communications Review**, Volume 8 Issue 1

Full text available: pdf(430.17 KB)

 Additional Information: [full citation](#), [abstract](#), [references](#)

Recently, geographic routing in wireless networks has gained attention due to several advantages of location information. Location information eliminates the necessity to set up and maintain explicit routes, which reduces communication overhead and routing table size. These advantages allow scalability especially in dynamic and unstable wireless networks. However, no matter which technologies or techniques a location system uses, its measurements will have some amount of quantifiable inaccuracy ...

3 An investigation of geographic mapping techniques for internet hosts

Venkata N. Padmanabhan, Lakshminarayanan Subramanian

 August 2001 **ACM SIGCOMM Computer Communication Review , Proceedings of the 2001 conference on Applications, technologies, architectures, and protocols for computer communications**, Volume 31 Issue 4

Full text available: pdf(319.78 KB)

 Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

4 Modeling methodology a: Simulation of large scale networks II: development of an internet backbone topology for large-scale network simulations

Michael Liljenstam, Jason Liu, David M. Nicol

 December 2003 **Proceedings of the 35th conference on Winter simulation: driving innovation**


Full text available: pdf(180.57 KB)

 Additional Information: [full citation](#), [abstract](#), [references](#)

A number of network simulators are now capable of simulating systems with millions of devices, at the IP packet level. With this ability comes a need for realistic network descriptions of commensurate size. This paper describes our effort to build a detailed model of the U.S. Internet backbone based on measurements taken from a variety of mapping sources and tools. We identify key attributes of a network design that are needed to use the model in a simulation, describe which components are av ...

5 Wireless sensor networks: Intelligent fluid infrastructure for embedded networks

Aman Kansal, Arun A. Somasundara, David D. Jea, Mani B. Srivastava, Deborah Estrin
June 2004 **Proceedings of the 2nd international conference on Mobile systems, applications, and services**

Full text available:  [pdf\(401.74 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Computer networks have historically considered support for mobile devices as an extra overhead to be borne by the system. Recently however, researchers have proposed methods by which the network can take advantage of mobile components. We exploit mobility to develop a fluid infrastructure: mobile components are deliberately built into the system infrastructure for enabling specific functionality that is very hard to achieve using other methods. Built-in intelligence helps our system adapt to run ...

Keywords: controlled mobility, data gathering, mobile router, sensor networks

6 GPSR: greedy perimeter stateless routing for wireless networks

Brad Karp, H. T. Kung

August 2000 **Proceedings of the 6th annual international conference on Mobile computing and networking**

Full text available:  [pdf\(1.41 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

We present Greedy Perimeter Stateless Routing (GPSR), a novel routing protocol for wireless datagram networks that uses the positions of routers and a packet's destination to make packet forwarding decisions. GPSR makes greedy forwarding decisions using only information about a router's immediate neighbors in the network topology. When a packet reaches a region where greedy forwarding is impossible, the algorithm recovers by routing around the perim ...

7 Composable ad hoc location-based services for heterogeneous mobile clients

Todd D. Hodes, Randy H. Katz


October 1999 **Wireless Networks**, Volume 5 Issue 5

Full text available:  [pdf\(403.18 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

8 GeoCast—geographic addressing and routing

Julio C. Navas, Tomasz Imielinski

September 1997 **Proceedings of the 3rd annual ACM/IEEE international conference on Mobile computing and networking**

Full text available:  [pdf\(1.68 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

9 DataSpace—querying and monitoring deeply networked collections in physical space

Tomasz Imieliński, Samir Goel

August 1999 **Proceedings of the 1st ACM international workshop on Data engineering for wireless and mobile access**

Full text available:  [pdf\(904.69 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

10 A Location Model for Communicating and Processing of Context

Michael Beigl, Tobias Zimmer, Christian Decker


January 2002 **Personal and Ubiquitous Computing**, Volume 6 Issue 5-6Full text available:  [pdf\(312.21 KB\)](#) Additional Information: [full citation](#), [abstract](#), [index terms](#)

Location is one of the most important elements of context in ubiquitous computing. In this paper we describe a *location model*, a *spatial-aware communication model* and an *implementation* of the models that exploit location for processing and communicating context. The location model presented describes a location tree, which contains human-readable semantic and geometric information about an organisation and a structure to describe the current location of an object or a context ...

Keywords: Digital artefacts, Experiences, Guidelines, Location model, RAUM, Spatial-aware communication

11 Building efficient wireless sensor networks with low-level naming

John Heidemann, Fabio Silva, Chalermek Intanagonwiwat, Ramesh Govindan, Deborah Estrin, Deepak Ganesan

October 2001 **ACM SIGOPS Operating Systems Review , Proceedings of the eighteenth ACM symposium on Operating systems principles**, Volume 35 Issue 5Full text available:  [pdf\(1.54 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In most distributed systems, naming of nodes for low-level communication leverages topological location (such as node addresses) and is independent of any application. In this paper, we investigate an emerging class of distributed systems where low-level communication does not rely on network topological location. Rather, low-level communication is based on attributes that are *external* to the network topology and *relevant* to the application. When combined with dense deployment of n ...

12 Service infrastructure and network management: Using code collection to support large applications on mobile devices

Lucian Popa, Irina Athanasiu, Costin Raiciu, Raju Pandey, Radu Teodorescu

September 2004 **Proceedings of the 10th annual international conference on Mobile computing and networking**Full text available:  [pdf\(252.95 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The progress of mobile device technology unfolds a new spectrum of applications that challenges conventional infrastructure models. Most of these devices are perceived by their users as "appliances" rather than computers and accordingly the application management should be done transparently by the underlying system unlike classic applications managed explicitly by the user. Memory management on such devices should consider new types of mobile applications involving code mobility such as mobile ...

Keywords: caching, code collection, garbage collection

13 Experimental testbeds and data: The changing usage of a mature campus-wide wireless network

Tristan Henderson, David Kotz, Ilya Abyzov

September 2004 **Proceedings of the 10th annual international conference on Mobile computing and networking**Full text available:  [pdf\(625.48 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Wireless Local Area Networks (WLANs) are now commonplace on many academic and corporate campuses. As "Wi-Fi" technology becomes ubiquitous, it is increasingly important to understand trends in the usage of these networks. This paper analyzes an extensive network trace from a mature 802.11 WLAN, including more than 550 access points and 7000 users over seventeen weeks. We employ several measurement techniques, including syslogs, telephone records, SNMP polling and tcpdump packet sniffing. This is ...

Keywords: 802.11, VoIP, WLAN, Wi-Fi, telephony, voice, wireless network

14 Managing routing tables for URL routers in content distribution networks

Zornitza Genova Prodanoff, Kenneth J. Christensen

May 2004 **International Journal of Network Management**, Volume 14 Issue 3

Full text available:  pdf(337.00 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Large-scale content distribution networks (CDNs) can be built using URL routers to redirect client HTTP requests to the nearest content source. URL routers employ very large routing tables. To improve the manageability of CDNs, we propose to use URL signatures to reduce the size of routing tables and aggressive hashing to speed-up routing look-ups.

15 Network protocols: A framework of secure location service for position-based ad hoc routing

Joo-Han Song, Vincent W.S. Wong, Victor C.M. Leung

October 2004 **Proceedings of the 1st ACM international workshop on Performance evaluation of wireless ad hoc, sensor, and ubiquitous networks**

Full text available:  pdf(211.73 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


In large and dense mobile ad hoc networks, position-based routing protocols can offer significant performance improvement over topology-based routing protocols by using location information to make forwarding decisions. However, so far security issues in position-based routing protocols has not been widely considered. In this paper, we identify several security problems of position-based routing protocols in mobile ad hoc networks. To avoid these problems, we propose the Secure Grid Location Ser ...

Keywords: ad hoc wireless networks, grid location service, position-based routing protocol, security

16 Span: an energy-efficient coordination algorithm for topology maintenance in ad hoc wireless networks

Benjie Chen, Kyle Jamieson, Hari Balakrishnan, Robert Morris

September 2002 **Wireless Networks**, Volume 8 Issue 5

Full text available:  pdf(230.89 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper presents *Span*, a power saving technique for multi-hop ad hoc wireless networks that reduces energy consumption without significantly diminishing the capacity or connectivity of the network. Span builds on the observation that when a region of a shared channel wireless network has a sufficient density of nodes, only a small number of them need be on at any time to forward traffic for active connections. Span is a distributed, randomized algorithm where nodes make local decisions ...

Keywords: energy, routing, topology-formation, wireless

17 Mobile computing: DataMan project perspective

Tomasz Imielinski

December 1996 **Mobile Networks and Applications**, Volume 1 Issue 4

Full text available:  [pdf\(239.53 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The objective of mobile computing is to develop system and application level software for small, battery powered terminals equipped with the wireless network connection. There is a rapidly growing interest in this field with companies spending billions of dollars developing technology and buying spectrum in the recent PCS auctions. In this paper we offer a perspective of mobile computing from the standpoint of our own research project at Rutgers University. The DataMan project (T.Imielinski ...

18 Mobile routing for large scale All-IP wireless network

Hongyi Li, Gerard Pieris

October 2000 **ACM SIGMOBILE Mobile Computing and Communications Review**, Volume 4 Issue 4

Full text available:  [pdf\(977.27 KB\)](#) Additional Information: [full citation](#), [index terms](#)

19 Tools and Methodologies: Nsclick:: bridging network simulation and deployment

Michael Neufeld, Ashish Jain, Dirk Grunwald

September 2002 **Proceedings of the 5th ACM international workshop on Modeling analysis and simulation of wireless and mobile systems**

Full text available:  [pdf\(279.41 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Ad hoc network protocols are often developed, tested and evaluated using simulators. However, when the time comes to deploy those protocols for use or testing on real systems the protocol must be reimplemented for the target platform. This usually results in two, completely separate code-bases that must be maintained. Bugs which are found and fixed under simulated conditions must also be fixed separately in the deployed implementation, and vice versa. There is ample opportunity for the two imple ...

Keywords: ad hoc, click, ns, simulation

20 Span: An energy-efficient coordination algorithm for topology maintenance in Ad Hoc wireless networks

Benjie Chen, Kyle Jamieson, Hari Balakrishnan, Robert Morris

July 2001 **Proceedings of the 7th annual international conference on Mobile computing and networking**

Full text available:  [pdf\(409.91 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper presents *Span*, a power saving technique for multi-hop ad hoc wireless networks that reduces energy consumption without significantly diminishing the capacity or connectivity of the network. Span builds on the observation that when a region of a shared-channel wireless network has a sufficient density of nodes, only a small number of them need be on at any time to forward traffic for active connections.

Span is a distributed, randomized algorithm where nodes make loca ...

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Published before December 2000

Terms used **geographically locating ISP**

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1 [A scalable and highly available system for serving dynamic data at frequently accessed web sites](#)

Jim Challenger, Paul Dantzig, Arun Iyengar

 November 1998 **Proceedings of the 1998 ACM/IEEE conference on Supercomputing (CDROM)**

 Full text available: pdf(195.17 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

This paper describes the system and key techniques used for achieving performance and high availability at the official Web site for the 1998 Olympic Winter Games which was one of the most popular Web sites for the duration of the Olympic Games. The Web site utilized thirteen SP2 systems scattered around the globe containing a total of 143 processors. A key feature of the Web site was that the data being presented to clients was constantly changing. Whenever new results were entered into the sys ...

2 [Evolution of Internet infrastructure in the twenty-first century: the role of private interconnection agreements](#)

Rajiv Dewan, Marshall Friemer, Pavan Gundepudi

 January 1999 **Proceeding of the 20th international conference on Information Systems**

 Full text available: pdf(202.56 KB) Additional Information: [full citation](#), [references](#), [index terms](#)

3 [What is actually taking place on web sites: e-commerce lessons from web server logs](#)

Mark Rosenstein

 October 2000 **Proceedings of the 2nd ACM conference on Electronic commerce**

 Full text available: pdf(257.12 KB) Additional Information: [full citation](#), [references](#), [index terms](#)

Keywords: case studies, graphical analysis, html, http, user interaction, visualization, web server logs

4 [Tools for higher education distance teaching](#)

John R. Cordani, Robert J. Tucker

 October 1998 **Proceedings of the 26th annual ACM SIGUCCS conference on User**


services

Full text available:  [pdf\(463.88 KB\)](#) Additional Information: [full citation](#), [index terms](#)

5 PRIISM: Internet Development in Asia Pacific

Tung X. Bui

April 1997 **ACM SIGMIS Database**, Volume 28 Issue 2

Full text available:  [pdf\(249.70 KB\)](#) Additional Information: [full citation](#)

**6 Delayed Internet routing convergence**

Craig Labovitz, Abha Ahuja, Abhijit Bose, Farnam Jahanian

August 2000 **ACM SIGCOMM Computer Communication Review , Proceedings of the conference on Applications, Technologies, Architectures, and Protocols for Computer Communication**, Volume 30 Issue 4


Full text available:  [pdf\(313.83 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper examines the latency in Internet path failure, failover and repair due to the convergence properties of inter-domain routing. Unlike switches in the public telephony network which exhibit failover on the order of milliseconds, our experimental measurements show that inter-domain routers in the packet switched Internet may take tens of minutes to reach a consistent view of the network topology after a fault. These delays stem from temporary routing table oscillations formed during ...

**7 Internet routing instability**

Craig Labovitz, G. Robert Malan, Farnam Jahanian

October 1997 **ACM SIGCOMM Computer Communication Review , Proceedings of the ACM SIGCOMM '97 conference on Applications, technologies, architectures, and protocols for computer communication**, Volume 27 Issue 4


Full text available:  [pdf\(1.95 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper examines the network inter-domain routing information exchanged between backbone service providers at the major U.S. public Internet exchange points. Internet routing instability, or the rapid fluctuation of network reachability information, is an important problem currently facing the Internet engineering community. High levels of network instability can lead to packet loss, increased network latency and time to convergence. At the extreme, high levels of routing instability have led ...

**8 IP multicast channels: EXPRESS support for large-scale single-source applications**

Hugh W. Holbrook, David R. Cheriton

August 1999 **ACM SIGCOMM Computer Communication Review , Proceedings of the conference on Applications, technologies, architectures, and protocols for computer communication**, Volume 29 Issue 4

Full text available:  [pdf\(1.66 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In the IP multicast model, a set of hosts can be aggregated into a group of hosts with one address, to which any host can send. However, Internet TV, distance learning, file distribution and other emerging large-scale multicast applications strain the current realization of this model, which lacks a basis for charging, lacks access control, and is difficult to scale. This paper proposes an extension to IP multicast to support the *channel* model of multicast and describes a specific realization ...



9 Building India's national Internet backbone

P. K. Agarwal

June 1999 **Communications of the ACM**, Volume 42 Issue 6Full text available:  [pdf\(206.34 KB\)](#)
 [html\(25.73 KB\)](#)Additional Information: [full citation](#), [index terms](#)10 Secure and mobile networking

Vipul Gupta, Gabriel Montenegro

December 1998 **Mobile Networks and Applications**, Volume 3 Issue 4Full text available:  [pdf\(223.39 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The IETF Mobile IP protocol is a significant step towards enabling nomadic Internet users. It allows a mobile node to maintain and use the same IP address even as it changes its point of attachment to the Internet. Mobility implies higher security risks than static operation. Portable devices may be stolen or their traffic may, at times, pass through links with questionable security characteristics. Most commercial organizations use some combination of source-filtering routers, sophisticated ...

11 On network-aware clustering of Web clients

Balachander Krishnamurthy, Jia Wang

August 2000 **ACM SIGCOMM Computer Communication Review , Proceedings of the conference on Applications, Technologies, Architectures, and Protocols for Computer Communication**, Volume 30 Issue 4Full text available:  [pdf\(568.99 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Being able to identify the groups of clients that are responsible for a significant portion of a Web site's requests can be helpful to both the Web site and the clients. In a Web application, it is beneficial to move content closer to groups of clients that are responsible for large subsets of requests to an origin server. We introduce clusters---a grouping of clients that are close together topologically and likely to be under common administrative control. We identify clu ...

12 Internet routing instability


Craig Labovitz, G. Robert Malan, Farnam Jahanian

October 1998 **IEEE/ACM Transactions on Networking (TON)**, Volume 6 Issue 5Full text available:  [pdf\(277.43 KB\)](#)Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: communication system, communication system routing, computer network, internet, routing, stability

13 Routing and handoff in the edge mobility architecture

Alan O'Neill, M. Scott Corson, George Tsirtsis

October 2000 **ACM SIGMOBILE Mobile Computing and Communications Review**, Volume 4 Issue 4Full text available:  [pdf\(1.75 MB\)](#)Additional Information: [full citation](#), [abstract](#), [index terms](#)

We consider a future IP network architecture in which the core topology is fixed but where the hosts at the edge of the network may be mobile, as is the case in cellular networks. Within this architecture, Mobile-Enhanced Routing (MER) protocols are used to support the prefix-routed requirements of the fixed Internet, along with the movement of IP addresses

allocated to mobile nodes. We outline a specific components for the support of such edge mobility (EMA:MER) that offers fixed/mobile IP netw ...

14 Computer speech: streaming technology

Judith M. Myerson

February 2000 **International Journal of Network Management**, Volume 10 Issue 1

Full text available: [pdf\(155.31 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Have you ever listened to a talking Web page[†] that became speechless in five minutes? Have you found it embarrassing while in a conference room of corporate executives? Have you ever wished the computer talker would slow down a little bit, so a decision maker can understand it? In answering these questions, we need to consider not only how the answers address the impacts of streaming technology on computer speech but also how they may affect ...

15 End-to-end routing behavior in the Internet

Vern Paxson

October 1997 **IEEE/ACM Transactions on Networking (TON)**, Volume 5 Issue 5

Full text available: [pdf\(255.09 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#), [review](#)

Keywords: communication system routing, computer network performance, computer network reliability, computer networks, failure analysis, internetworking, stability

16 Cluster-based scalable network services

Armando Fox, Steven D. Gribble, Yatin Chawathe, Eric A. Brewer, Paul Gauthier

October 1997 **ACM SIGOPS Operating Systems Review , Proceedings of the sixteenth ACM symposium on Operating systems principles**, Volume 31 Issue 5

Full text available: [pdf\(2.42 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

17 Competitive advantage on the World Wide Web: a webmaster's guide

Merrill E. Warkentin

October 1995 **ACM SIGAPP Applied Computing Review**, Volume 3 Issue 2

Full text available: [pdf\(779.01 KB\)](#) Additional Information: [full citation](#), [abstract](#), [index terms](#)

As the importance of the World Wide Web continues to grow, firms are seeking innovative ways to leverage the technology for competitive advantage. Firms are implementing web-based systems for internal and external information dissemination and for digital interactivity, including commerce. This paper highlights some of these uses of the web and addresses managerial and technical considerations when initiating a web site project, both on the server side and client side of the web. The focus is on ...

Keywords: digital commerce, internet security, intranet, web design, web server

18 Modularity and multi-microprocessor structures

D. P. Siewiorek

September 1974 **Conference record of the 7th annual workshop on Microprogramming**

Full text available: [pdf\(620.29 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

There are significant advantages to a modular approach to system design. As


semiconductor technology has evolved the complexity of what a designer considers as a design primitive has also grown. Systems constructed from the next generation of module sets will bear a strong resemblance to multiprocessor structures. A taxonomy of the multiprocessor space is given and the subspace to be occupied by the next generation module sets is delineated. Summaries are given of recent research results on ...

19 China's state-coordinated Internet infrastructure

Zixiang (Alex) Tan, William Foster, Seymour Goodman

June 1999 **Communications of the ACM**, Volume 42 Issue 6

Full text available:  [pdf\(260.59 KB\)](#)

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20 Electronic commerce: a half-empty glass?

Sasa Dekleva

June 2000 **Communications of the AIS**

Full text available:  [pdf\(343.49 KB\)](#)

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